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SPOOR AND FISHER

JP/C 527

FORM P.7.
(To be lodged in duplicate)

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978

COMPLETE SPECIFICATION

(Section 30(1) – Regulation 28)

OFFICIAL APPLICATION NO.		LODGING DATE	
21 01	83[illegible]060	22	29TH APRIL 1983

INTERNATIONAL CLASSIFICATION	
51	E21C

FULL NAME(S) OF APPLICANT(S)

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FULL NAME(S) OF INVENTOR(S)

72 VINCENT ALEXANDER CHRISTOPHER CRAYTHORN

TITLE OF INVENTION

54 "MINING MACHINE"

CLAIMS:

1.

A mining machine including a cylindrical cutter drum rotatable about its axis and having a series of removable, rotatable cutters at its periphery, means for rotating the drum about its axis, thrust means actuable to thrust the drum in a direction normal to its axis, and means connecting the thrust means with the drum to transfer the thrust of the thrust means to the drum, the connecting means being connected to the drum between its ends, and being arranged to permit rotation of the drum as it is thrusted.

2.

A mining machine according to claim 1, including means for adjusting the orientation of the drum about the thrust direction, means for adjusting the thrust direction about the drum axis, and means for adjusting the thrust direction about an axis mutually at right angles to the drum axis and the thrust direction.

3.

A mining machine according to claim 2, in which the thrust means includes a double-acting hydraulic ram the piston of which is connected to the drum, which is orientated laterally in use and which is pivotally supported between two upright hydraulic props actuable to engage the hanging and footwalls of a mine working in which the machine is operated to provide an abutment against which the ram can react when actuated.

4.

A mining machine according to claim 3, in which the hydraulic props each have an upper and a lower leg which are extensible and retractible independently of one another to enable the elevation of the point of pivotal support of the ram, and hence the thrust direction, to be adjusted.

5.

A mining machine according to either one of claims 3 or 4, in which the ram is movable laterally between the two props for adjustment of the thrust direction about an axis mutually at right angles to the drum axis and the thrust direction.

6.

A mining machine according to claim 5, in which the ram is connected to one of the props by a rigid link, the length of which is adjustable.

7.

A mining machine according to claim 6, in which the link is provided with a turnbuckle.

8.

A mining machine according to any one of claims 3 to 7, in which the piston is connected to the drum via a frame which carries two independently operable double-acting props engagable with the hanging and footwalls to act in conjunction with the abutment props to provide the machine with a walking capability.

9.

A mining machine according to claim 8, in which each of the walking props has an upper and a lower leg which are extensible and retractible independently of one another to raise or lower one side of the frame and adjust the orientation of the drum about the thrust direction.

10.

A mining machine according to any one of the preceding claims, in which the connecting means connecting the thrust means to the drum includes spaced circumferential slots in the periphery of the drum, a series of roller bearings located in each slot for free revolution about the drum axis, and for each slot a casing encircling the bearings, the thrust means being arranged to act on the casing.

11.

A mining machine according to claim 10, in which the casings have rigid extensions extending in a direction normal to the drum axis for connection via a rigid frame to the piston of a double-acting ram providing the thrust means.

12.

A mining machine according to claim 11, in which the frame carries a motor actuable to rotate the drum about its axis.

13.

A mining machine according to claim 12, in which the motor is arranged to rotate the drum via a belt and pulley linkage.

14.

A mining machine according to claim 12, in which the motor is arranged to rotate the drum via a chain and sprocket linkage.

15.

A mining machine according to claim 12, in which the motor is arranged to rotate the drum via a gear train.

16.

A mining machine according to any one of the preceding claims, in which the motor is an hydraulic motor, and an hydraulic power pack is provided for powering the motor.

17.

A mining machine according to any one of the preceding claims, including means for directing broken rock accumulating behind the drum in use in a lateral direction.

18.

A mining machine according to claim 17, in which the means includes an endless belt, rollers supporting the belt, means for driving the belt in a direction parallel to the drum axis, and replaceable brushes arranged on the belt to sweep the broken rock to one side of the machine.

19.

A mining machine according to either one of claims 17 or 18, in which the means includes spray means for directing a jet of water onto the broken rock to direct it to one side of the machine.

20.

A mining machine according to any one of the preceding claims, including means for direction water onto a rock face attacked by the drum in use to allay dust.

21.

A mining machine according to any one of the preceding claims, in which the cutters are generally cylindrical in shape and are mounted in staggered relationship around the drum periphery, with each cutter being freely rotatable about its own axis, with each having its axis at an angle to the drum axis, and with each having annular cutting edges secured to its periphery.

22.

A mining machine according to claim 21, in which a cutter has a non-circular longitudinally extending projection at each of its ends, a first of the projections being seated in a complementary socket formed in a member secured at the periphery of the drum, and the second of the projections being acted upon by a wedge element secured to the periphery of the drum to force the first projection into its socket, the cutter being rotatable relative to the projections.

23.

A cutter for mounting on the rotatable cutter drum of a mining machine, the cutter including a cylindrical shell, annular cutter edges secured removably to the periphery of the shell, and longitudinally extending, non-circular projections at either end of the shell for location in a complementary socket associated with the periphery of the drum and for engagement by a wedge element secured to the periphery of the drum respectively, the shell being freely rotatable with respect to the projections.

24.

A cutter according to claim 23, including annular spacers encircling the shell between adjacent cutter edges.

25.

A cutter according to claim 23 or claim 24, in which the projection for engagement by the wedging element has a chamfered edge shaped to be acted upon by a complementary surface of the wedge element, with the wedge element serving to force the other projection to seat tightly in the socket in use.

26.

A cutter mounting assembly including a generally cylindrical cutter shell, annular cutter edges encircling the shell, a first non-circular projection at one end of the shell seated in a complementary socket associated with the periphery of a cutter drum with the cutter extending at an angle to the surface of the cutter drum, a second, non-circular projection at the opposite end of the shell, and a wedge element secured releasably to the periphery of the drum and having a surface acting upon a complementary chamfered surface of the second projection to force the first projection to seat tightly in the socket, the shell being freely rotatable with respect to the projections.

27.

A mining machine substantially as herein described with reference to the accompanying drawings.

28.

A cutter substantially as herein described with reference to Figures 5 and 6 of the accompanying drawings.

29.

A cutter mounting assembly substantially as herein described with reference to Figures 5 and 6 of the accompanying drawings.

DATED THIS 29TH day of APRIL, 1983

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SPOOR AND FISHER

APPLICANT'S PATENT ATTORNEYS